

B. Amendments to the Claims:

This listing of claims will replace all prior versions and listing of claims in the application:

1. (currently amended) An artificial graft comprising a synthetic tubular element having a luminal surface coated with a plurality of endothelial cells that have been genetically transformed with a) at least one sequence to express or over-express at least one endothelial cell proliferating growth factor and b) at least one sequence to express or over-express at least one cellular adherence factor.
2. (currently amended) The artificial vascular graft of claim 1, wherein a first portion of said plurality of endothelial cells is genetically transformed with at least one sequence to express or over-express said at least one endothelial proliferating growth factor and a second portion of said plurality of endothelial cells is genetically transformed with at least one sequence to express or over-express said at least one cellular adherence factor.
3. (currently amended) The artificial vascular graft of claim 1, wherein said luminal surface comprises polytetrafluoroethylene (PTFE), expanded polytetrafluoroethylene ([d]ePTFE), polyester fiber, poly(ethylene glycol-co-terephthalic acid) (DACRON®) or processed animal blood vessels.
4. (previously presented) The artificial vascular graft of claim 1, wherein said synthetic tubular element is of an inner cross-sectional area which is substantially equivalent to an inner cross-sectional area of a blood vessel.
5. (previously presented) The artificial vascular graft of claim 4, wherein said inner cross-sectional area of said synthetic tubular element is about 7 to about 700 mm.²
6. (previously presented) The artificial vascular graft of claim 1, wherein said plurality of endothelial cells are obtained from a segment of a vein or circulating endothelial cells or are derived from bone marrow progenitor cells or peripheral blood stem cells.

7. (previously presented) The artificial vascular graft of claim 1, wherein said plurality of endothelial cells are obtained from an intended recipient of the artificial graft.

8 (previously presented) The artificial vascular graft of claim 1, wherein said plurality of endothelial cells are obtained from a human or animal donor.

9. (previously presented) The artificial vascular graft of claim 1, wherein said plurality of endothelial cells form a confluent monolayer at said luminal surface.

10 (original) The artificial vascular graft of claim 1, wherein said at least one endothelial cell proliferating growth factor is selected from the group consisting of VEGF, acidic or basic FGF, and HGF.

11. (currently amended) The artificial vascular graft of claim 1, wherein said at least one cellular adherence factor is ~~DANCE~~ or UP50.

12. (original) The artificial vascular graft of claim 1, wherein said plurality of endothelial cells are further genetically transformed to express at least one marker polypeptide.

13-18. (canceled)

19. (currently amended) A method of producing an artificial vascular graft, the method comprising the steps of:

(a) genetically transforming endothelial cells with at least one sequence to express or over-express at least one endothelial cell proliferation growth factor and with at least one sequence to express or over-express at least one cellular adherence factor; and,

(b) culturing said endothelial cells with a synthetic tubular element having a luminal surface until sufficient endothelialization of said luminal surface is achieved.

20. (currently amended) The method of claim 19, wherein step (a) is effected by genetically transforming a first portion of said endothelial cells with at least one sequence to express or over-express said at least one endothelial proliferation growth factor and genetically

transforming a second portion of said endothelial cells with at least one sequence to express or over-express said at least one cellular adherence factor.

21. (original) The method of claim 19, wherein said step (a) precedes said step (b).

22. (original) The method of claim 19, wherein said step (b) precedes said step (a).

23. (previously presented) The method of claim 19, wherein said endothelial cells are obtained from a segment of a vein or circulating endothelial cells or are derived from bone marrow progenitor cells or peripheral blood stem cells.

24. (original) The method of claim 19, further comprising the step of subjecting said luminal surface of said artificial graft to flow forces.

25. (original) The method of claim 19, wherein said artificial graft is used in bypass surgery.

26-50. (canceled)

51. (currently amended) A method of producing genetically transformed endothelial cells, the method comprising the steps of:

(a) obtaining endothelial cells from a source selected from the group consisting of a segment of a vein and bone marrow progenitor cells; and,

(b) transforming said endothelial cells with at least one sequence to express or over-express at least one endothelial cell proliferation growth factor and with at least one sequence to express or over-express at least one cellular adherence factor concurrently.

52. (currently amended) A method of replacing or bypassing at least a portion of a vascular system of an individual, the method comprising the step of implanting into the vascular system of the individual an artificial vascular graft so as to form a fluid communication between the vascular system and said artificial vascular graft, said artificial vascular graft comprising a synthetic tubular element having a luminal surface coated with a plurality of endothelial cells genetically transformed with at least one sequence to express or over-express at least one

endothelial cell proliferating growth factor and with at least one sequence to express or over-express at least one cellular adherence factor.

53. (currently amended) The method of claim 52, wherein a first portion of said plurality of endothelial cells is genetically transformed with at least one sequence to express or over-express said at least one endothelial cell proliferation growth factor and a second portion of said plurality of endothelial cells is genetically transformed with at least one sequence to express or over-express said at least one cellular adherence factor.

54. (previously presented) The method of claim 52, wherein said synthetic tubular element has an inner cross-sectional area which is substantially equivalent to an inner cross-sectional area of a blood vessel.

55. (previously presented) The method of claim 54, wherein said inner cross-sectional area of said synthetic tubular element is about 7 to about 700 mm².